Index

alkyl radicals, specificity of acception in oxidising polymers, 326-327
alkylperoxycyclohexadienones, formation, 91
amines
  aliphatic, hindered, 101-102
  aromatic, structure, 8
  aromatic and hydroaromatic
    stabilization mechanisms, 95-101
    structure, 95-101
  hindered aliphatic amines (HALS), 97
aminyls, formation, 96
anatase, *see* titanium dioxide
antimony and bismuth trihalide–melamine complexes
  fire retardancy, 59, 68-71
  thermal degradation, 58, 63-68
  thermal degradation and fire retardancy, 55-68
antioxidants
  arylamine antioxidant, polypropylene, 28
  bound, and polymer modifications, 25-30
  2,6-di-*tert*-butyl-4-methylphenol, 88
  2,6-di-*tert*-butyl-p-cresol, 56
  catalytic regenerative chain breaking antioxidants, 6-11
  chain breaking, 3-11
    catalytic regenerative chains, 6-11
    donors and acceptors, 3-6
  classification, 2-3
  dilaurothiodipropionate (DLTDP), 274
antioxidants—*contd.*
  hindered phenolic antioxidants, 333-345
  mechanisms of action
    novel systems via controlled oxidative processing of polymers, 24-25
    reactive processing, bound antioxidants and polymer modifications, 25-30
    time-controlled stabilization of polyolefins, 22-23
  monomeric, *see* BHC; BHM; BHS
  peroxidolytic, 11-12
  phenolic antioxidants
    HALS, and, 104-105
    inhibited thermooxidation of a polyether, 119-124
  preventive, 11-20
  thermal processing, effect on polymer stabilization, 20-22
  transformation products, stabilization mechanisms, 85-107
  vinyl-containing, low binding, 29
  see also polymer oxidation processes; stabilizers
AO1, UV and visible absorption characteristics, 338
AO2
  concentration, *vs* oxidative induction time, HDPE, 344
  diester and triester transformation products antioxidant performance, 343

AO2—*contd.*
diester and triester transformation products—*contd.*
structure, 344
AO3, AO4, colour development in polyolefins, 336-345
arylamine antioxidant, polypropylene, 28
autoxidation, radical chain theory, 2-3

benzo(a)pyrene semiquinone radicals, ESR and ENDOR spectra, 174-178
benzoquinone
colour development in polyolefins, 334-345
structure, 7
transformation species, 88-89
UV and visible absorption characteristics, 338
benzoquinone-diimine
formation, PD antidegradants, 100
stabilization, 96
1,4-benzoquinone-dioxime, vulcanization, stability, 106
benzoquinone-methides, transformation species, 88-89
benzoquinone-monoimine
colored systems, 97
P radical scavengers, 100
stabilization, 96
benzoquinones, P radical scavengers, 100
benzoyl peroxide (BPO), free radical initiator for grafting, 297
BHT, *see* 2,6-di-*tert*-butyl-4-methylphenol
2,2'-bis-(3,5-di-*tert*-butyl-4-hydroxyphenyl) acetaldehyde, structure, 90
bis-quinone methide, conjugated, 334-345
bis-quinone methide, conjugated/unconjugated, UV and visible absorption characteristics, 338
bis-quinone methide, unconjugated, colour development in polyolefins, 334-345
biscinnamate
colour development in polyolefins, 334-345
UV and visible absorption characteristics, 338
bismuth trihalides, *see* antimony and bismuth trihalide–melamine complexes
BQ, *see* benzoquinones
BQDI, *see* benzoquinone-diimine
BQMI, *see* benzoquinone-monoimine

2,6-di-*tert*-butyl-1,4-benzoquinone, structure, 93
3,5-3',5'-tetra-*tert*-butyl-4,4-diphenoquinone, structure, 93
2,6-di-*tert*-butyl-4-(3,5-di-*tert*-butyl-4-hydroxybenzilidene)-2,5-cyclohexadiene-1-one, structure, 89-90
2,6-di-*tert*-butyl-4-(3,5-di-*tert*-butyl-4-hydroxybenzyl)-2,5-cyclohexadiene-1-one, structure, 91
3,5-di-*tert*-butyl-4-hydroxybenzyl methacrylate (BHM)
melt grafting onto polyethylene, high density, 302
melt grafting onto polyethylene, low molecular weight, 304
polyethylene-bound antioxidant, 297-306
2,6-di-*tert*-butyl-4-hydroxybenzaldehyde, formation, 91
trans-3,5-di-*tert*-butyl-4-hydroxycinnamic acid (BHC)
melt grafting onto polyethylene, high density, 302
melt grafting onto polyethylene, low molecular weight, 304
polyethylene-bound antioxidant, 297-306
3,5-di-*tert*-butyl-4-hydroxystyrene, polyethylene-bound antioxidant, 297-306
3,5-di-*tert*-butyl-4-hydroxystyrene (BHS)
melt grafting onto polyethylene, high density, 302
melt grafting onto polyethylene, low molecular weight, 304
2,6-di-*tert*-butyl-4-methylphenol (BHT)
inhibited thermooxidation of a polyether, 119-124
nitroxide/BHT system, reaction pathways, 105
polyolefins, 4
regeneration, 104
transformation mechanisms, 88
2,6-di-*tert*-butyl-p-cresol, 56
22,6-di-*tert*-butylphenol, oxidation, 106

carbazole-containing compounds
photoconductivity, 245-246
see also poly(vinylcarbazole) (PVK)
carbonyl index
defined, 40
photo-oxidation of polypropylene, 40-45

catechol phosphates, peroxidolytic antioxidants, 12
CB-A, CB-D antioxidants, *see* chain breaking acceptor/donor antioxidants
cell, cellular sources of oxygen free radicals, 170
chain breaking antioxidants, 3-11
chain breaking acceptor antioxidants
  fully hindered phenols, 6
  mechanism, 6-7
  nitro-compounds, 6
  quinones, 5
chain breaking donor antioxidants, reducing action, 3-4
CHD, *see* cyclohexadienones
chemiluminescence
  integrated, effect of stabilizers, 37-52
  photo-oxidation of polypropylene, 38
  polypropylene peroxides
    decomposition, during, 269-273
    formation, during, 267-269
    origin, 273-276
    relationship to peroxide content, 263-276
  total luminous intensity, 267-274
CHP, decomposition in chlorobenzene, nickel dithiolates, 17
chromatography, gel permeation chromatography, 284
cobalt dithiolates, antioxidant action, 19-20
cold ring fraction (CRF) products, terephthalate polyesters, 190-200
copper
  catalytic regenerative chain breaking antioxidants, 7-9
  cupric acetate, photo-oxidation, 7-9
copper dithiolates, antioxidant action, 19-20
cyclic catechol phosphites, peroxidolytic antioxidants, 12
cyclic chain termination
  hydroperoxides, 329-330
  nitroxyl radicals, acid catalysis, 330-331
cyclic phosphate esters, structure, 12
cyclohexadienones, transformation species, 88-90
cyclopentadienones, formation, 91

DHQ, *see* dihydroquinolines
2,6-dialkylphenol, and N-isopropyl-N'-phenylbenzoquinone-diimine, 103
diamine 1,4-diazabicyclo [2.2.2]-octane (DABCO), 224
dicumyl peroxide (DCPO), free radical initiator for grafting, 297
differential scanning calorimetry (DSC), 127-128, 266-267
  advantages, 345
  oxidative induction time, HDPE, *vs* AO2 concentration, 344
  oxidative induction times, 337
dihydroquinolines
  antidegradants, 97
  C–N coupling, 96
  formation, 95-101
  see also quinolines
dilaurothiodiproponate (DLTDP), antioxidant, effect on polypropylene chemiluminescence, 274
2,3-dimethyl-2.3-diphenylbutane (DMDPB)
  free radical initiators, 56
  with polypropylene and bismuth bromide.6melamine, iso-oxygen index curves, 69-70
dioctyl phthalate, plasticizer, screening effect, 163-164
diphenoquinone
  colour development in polyolefins, 334-345
  UV and visible absorption characteristics, 338
diphenylamines
  formation, 95-101
  unsubstituted, 97
dithiocarbamates, structure, 12-13
dithiolates
  nickel complexes, antioxidant action, 16-19, 25
  UZ stabilization, 16
dithiophosphates, structure, 12-13
DLTDP, *see* dilaurothiodiproponate
DPA, *see* diphenylamines
DRTSA, *see* thiosulphonic acid
DTRTnPA, *see* thionophosphoric acid

enzymatic (cellular) sources of oxygen free radicals, 170
EPR signals, nitrones, 99
ESR and ENDOR spectra
  enzymatic reactions
    benzo(a)pyrene semiquinone radicals, 174-178

ESR and ENDOR spectra—*contd.*
enzymatic reactions—*contd.*
haemoprotein intramolecular electron transfer, 172-174
oxygen free radicals, 170-172
ethers and polyethers, thermoxidation
inhibited thermooxidation by phenolic antioxidants, 119-124
uninhibited thermooxidation of a polyether, 111-118
PEA oxidation, 112-118
ethylbenzene, specificity of alkyl radicals, 326-327
ethylene bisphenol, structure, 4
exciplex polymer–oxygen migration, 228, 231-233

fire retardancy, antimony and bismuth trihalide–melamine complexes, 59, 68-71
formic acid, retardant, demethylation of NHC_3-HALS, 238

galvinoxyl
stability, inhibited oxidation, 90
structure, 8
gamma-irradiation, oxidation of PE, 310, 311-316
gel permeation chromatography, 284

haemoprotein intramolecular electron transfer, ESR and ENDOR spectra, 172-174
HALS
nitroxides, 97
1,2,2,6,6-pentamethyl-4-piperidyl octdecanoate (HALS-4), 206
bis-1,2,2,6,6-pentamethyl-4-piperidyl sebacate (HALS-2), 206
photo-oxidation inhibitors, 101-102
nitroxyl radicals as intermediates, 325
thiosynergists, and, 106
HALS, *N*-methylated
photostabilization of polyolefins
experimental kinetics of demethylation, 223-233
formal kinetics of demethylation, 233-238
mechanisation of demethylation of NHC_3-HALS, 223-233
HDPE, *see* polyethylene, high density

hindered aliphatic amines, *see* HALS
hindered phenolic antioxidants
AO1, structure, 339
transformation products, 333-345
Hostalen SE2, structure, 40
hydroperoxides
cyclic chain termination, 329-330
decomposition, 11
measurement, chemiluminescence, 40
oxidation of polyether alcohol (PEA), 112-114, 119-124
oxidative degradation processes, 2-3
photolysis, photo-oxidation of polypropylene, 37-38
stability, 11
stoichiometric reaction with sulphur dioxide, 14
see also peroxides
hydroperoxycyclohexadienones, formation, 91
hydroquinone, chain breaking acceptor antioxidants, 6-7
hydroxylamines, formation, 100

IR spectroscopy, 284, 297, 298
FT-IR spectra, 285
poly(vinyl chloride) with styrene–acrylonitrile, 129-131
photon fluence rate, monochromatic light, 78, 81-83
polyethylene, linear low density, 313-315
Irgafos 168, structure, 40
Irganox 1010
effect on polypropylene chemiluminescence, 274
inhibited thermooxidation of a polyether, 119-124
structure, 5, 39
thermooxidative stability of polypropylene, 29
iron, one-electron transfer mechanisms, 173
iron dithiocarbonate, antioxidant action, 23-24
iron dithiolates, antioxidant action, 19-20
N-isopropyl-N'-phenylbenzoquinonediimine, and 2,6-dialkylphenol, 103

K vitamins, semiquinone radicals, ESR and ENDOR spectra, 178-184

light emission, *see* chemiluminescence

LLDPE, *see* polyethylene, linear low density

maleate, reactive processing, 28-29
maleimide, reactive processing, 28-29
melamine, IR spectra, 60, 61, 62
melamine complexes of antimony and bismuth trihalides
  fire retardancy, 59, 68-71
  formation, 56-60
  IR spectra, 60
  iso-oxygen index curves, 69
  thermal degradation, 58, 63-68
melt processing, degradation of polyolefins, 279-293
mercaptobenzimidazole, stabilization mechanisms, 86-88
mercaptobenzothiazole, stabilization mechanisms, 86-88
mercury lamp, UV spectrum and wavelength distribution, polychromatic light, 77, 78-81
metal halides, addition to polymer (melamine), 56-57
microwave photodielectric studies, measurement, 247, 254-261
monomeric antioxidants, *see* BHC; BHM; BHS

naphthosemiquinone radicals, 179
NHC_3-HALS, demethylation, oxygen free radicals, 223-233
nickel dibutyl dithiophosphate (NiDBP), 16-20
nickel diethyldithiocarbamate (NiDEC), effect on polypropylene chemiluminescence, 274
nickel dithiolates, antioxidant action, 16-20
nitrones
  EPR signals, 99
  phenolic, structure, 8
nitroso compounds
  aliphatic and aromatic, 8
  alkyl and aryl, 8
nitroxides
  formation, 96
  nitroxide/BHT system, 105
  P trapping, 100
  PD series, 99
  reactivity, 97-100
nitroxyl radicals
  advantages over phenols, 327
nitroxyl radicals—*contd.*
  alkylhydroxylamine, and, redox couples, 10-11
  cyclic chain-termination, 325, 327-328
  formation from HALS, 326
  hindered piperidine, 8
    light stabilization, 325-332
    phenoxyl free radicals, and, stability, 9
  2,2,6,6-tetramethyl-4-benzoyl-piperidine-N-oxyl, 326-327

octadecyl-3-(3,5-di-*tert*-butyl-4-hydroxy-phenyl) propionate (AO1)
  hindered phenolic antioxidant, 335
  structure, 339
3,7-di-*tert*-octyl-1H-phenoxazone, formation, 96
4,4'-di-*tert*-octyldiphenylamine doping, pentaerythritol ester oil, 96
N-(4-*tert*-octylphenyl)-1-naphthylamine, BQMI compounds, 97
one-electron transfer, ESR and ENDOR spectra, 169-184
oxygen free radicals
  demethylation of NHC_3-HALS, 223-233
  enzymatic reactions, ESR and ENDOR spectra, 170-172
  free radical scavengers, 298
    see also antioxidants
  initiators, 2,3-dimethyl-2.3-diphenylbutane (DMDPB), 56
  melt processing of polyolefins
    first (peroxy radical), 281-282
    second (alkoxy radical), 282
  one-electron transfer, 169-184
    cellular sources, 170
  stability, nitroxyl and phenoxyl, 9
oxygen index, defined, 59

PC/PMMA, *see* polycarbonate/poly(methyl methacrylate)
PD, *see* phenylenediamines
pentaerythritol ester oil, 4,4'-di-*tert*-octyldiphenylamine doping, 96
1,2,2,6,6-pentamethyl-4-piperidyl octdecanoate (HALS-4), 206
bis-1,2,2,6,6-pentamethyl-4-piperidyl sebacate (HALS-2), 206

peroxides
  polypropylene, relationship of chemiluminescence to peroxide content, 263-276
  see also hydroperoxides
peroxidolytic antioxidants
  phosphite esters, 11-12
  sulphur-containing, 11-12
  UV stabilization, 12
peroxydienones, structure, 4-5
phenolic antioxidants
  HALS, and, 104-105
  inhibited thermooxidation of a polyether, 119-124
phenolic quinonemethides, 90
phenolic sulfides
  stabilization mechanisms, 92-95
  structure, 92-95
phenols
  fully hindered, 5
  hindered, stabilization mechanisms, 88-92
  product studies, 2,6-di-*tert*-butyl-4-methylphenol, 88
  structure, 88-92
phenoxyls, primary, chain breaking activity, 88-89
phenylenediamines
  aminyls formed, transformation into BQDI, 97
  antidegradants, 100
  2,6-dialkylphenol, and, 103
  formation, 95-101
phosphite esters, peroxidolysis, stoichiometric (PD-S), 11-12
phosphites
  colour development in polyolefins, 336-345
  effect on PP formulations, with/without stabilizer, 343
  minimisation of colour formation during procesing, 342
  stabilizers, photo-oxidation of polypropylene, 41-51
photo-catalytic pigments
  titanium dioxide, 155-163
  zinc oxide, 155-163
photo-oxidation, compared with thermo-oxidation, 153-155
photoconductivity
  carbazole-containing compounds, 245-246
  defined, 247-249
photoconductivity—*contd.*
  measurement, 246-247, 250-253
photodielectric effect, defined, 249-250
photostabilizers, polyolefins, 8-9
piperidine
  hindered aliphatic amines, 101-102
  hindered piperidine light stabilization, nitroxyl radicals, 325-332
Plastanox 2246, effect on polypropylene chemiluminescence, 274
plasticizers, influence of photochemical evolution of PVC, 163-164
poly(butylene terephthalate) (PBT), thermal degradation studies, 190-203
polycarbonate/poly(methyl methacrylate) blends
  photo-degradation mechanism, wavelength dependence, 75-84
  photo-irradiation
    monochromatic light, 77
    polychromatic light, 76
poly(decamethylene terephthalate) (PDMT)
  structure, 188
  thermal degradation studies, 190-203
polyenes, formation from PVC, 136-166
polyether, *see also* ethers and polyethers, thermoxidation
polyether alcohol (PEA)
  oxidation, 112-118
  see also Systol T
polyethylene, high density
  changes during melt processing, 288-292
  chemiluminescence, 265
  colour development, hindered phenolic antioxidants, 336-345
  degradation during melt processing, 279-293
  melt grafting, 297-302
  oxidative induction times, 337
polyethylene, linear low density
  colour development, hindered phenolic antioxidants, 336-345
  hydroperoxide decomposition products, 309-323
  IR spectroscopy, 313-315
  pre-gamma-oxidised
    gamma-irradiation concentration changes, 316
    IR extinction coefficient, 314
    oxidation products, 314
    photolysis concentration changes, 316

polyethylene, linear low density—*contd.*
pre-gamma-oxidised—*contd.*
thermal exposure concentration changes, 316
polyethylene, low molecular weight, melt grafting, 303-304
poly(ethylene terephthalate) (PET), thermal degradation studies, 190-203
polyethylene-bound antioxidants, 295-307
grafting procedure, 297-306
spectroscopy, 297-298
polymer oxidation processes
novel systems via controlled oxidative processing, 24-25
peroxide determination, 263-266
reactive processing, bound antioxidants and polymer modifications, 25-30
stabilization
effect of thermal processing, 20-22
time-controlled, 22-23
see also antioxidants
polyolefins
BHT, 4
colour development, ageing or heating, 333-345
degradation during melt processing, 279-293
photo-oxidation, and hydroperoxides, 20-22
photostabilization with HALS
experimental kinetics of demethylation, 211-223
formal kinetics of demethylation, 233-238
mechanisation of demethylation of NHC_3-HALS, 223-233
thermal processing, effects, 20-22
thermo-oxidation cycle, 281
see also polypropylene
polypropylene
arylamine antioxidant, 28
changes during melt processing, 284-288
colour development, hindered phenolic antioxidants, 336-345
cyclic chain termination, nitroxyl radicals, 329-330
degradation during melt processing, 279-293
melt stabilizer, tocopherols, 5
mixture with bismuth bromide, iso-oxygen index curves, 69
polypropylene—*contd.*
oxidative stability, 25
oxygen index, 59
peroxides, relationship of chemiluminescence to peroxide content, 263-276
photo-oxidation
carbonyl and hydroperoxide group formation, 40-45
effect of stabilizers on integrated chemiluminescence, 37-52
hydroperoxide formation, short periods, 45-51
polydispersity index (PDI), 285
thermoxidative stability, with/without glass fibre, various antioxidants, 29
see also polyolefins
poly(vinyl chloride)
α-methylstyrene–acrylonitrile, with applications, 126
photodegradation, 125-132
film preparation, 137-138
long-term durability, prediction, 164-166
oxidation products, identification, 136
oxygen saturation under irradiation, 136
photo-discoloration
mechanisms, 144-149
mono/polychromatic irradiation, 139-140
photostability, 139-140
wavelength effects, 138-140
photo-oxidation
chlorocarboxylic acid formation, 147-148
chloroketone formation, 147-148
mechanisms, 144-149
mono/polychromatic irradiation, 141-144
wavelength effects, 140-144
photochemical evolution, influence of plasticizers, 163-164
photochemical and thermal oxidations, carbonylated products compared, 139-155
photolysis and photo-oxidation, 137-149
photothermal and thermal oxidations, 135-166
pigmented, 137
kinetics of photo-oxidation and photo-discoloration, 157-161

poly(vinyl chloride)—*contd.*
pigmented—*contd.*
mono/polychromatic irradiation, 156-157
photo-catalytic oxidation, 161-163
photo-oxidation, 155-163
polyene formation, 136-166
styrene–acrylonitrile, with, photodegradation, 125-132
thermal processing, effects, 20-22
thermo-oxidation
comparison with photo-oxidation, 153-155
products, 149-153
poly(vinylcarbazole) (PVK)
binder matrix, 249
photoconductivity, 250-253
photodielectric effect, 249-250

QM, *see* benzoquinonemethides
quinoid compounds, sulfur-free, 94
quinoid structures, 92
quinolines, 6-ethoxy-2,2,4-trimethyl-1,2-dihydroquinoline, 97
quinolones
8(6-ethoxy-2,2,4-trimethyl-1,2-dihydro-1-quinolyl)-2,2,4-trimethyl-6-quinolone, 97
6-ethoxy-2,2,4-trimethyl-8-quinolone, 97
2,2,4-trimethyl-6-quinolone, 97
2,2,4-trimethyl-6-quinolone-N-oxide, 97
quinoneimines, alkyl radical scavengers, 101
quinones, antioxidants, chain breaking acceptor antioxidants, 5

redox couples, photostabilizers, 9-11
rheometrics, RDA-700, 283
rubber
mechanoscission
free radicals, 26-27
thiol addition, 27-28
vulcanization, and antioxidant action, 26-28
rutile, *see* titanium dioxide

semiquinone radicals
ESR and ENDOR spectra
benzo(a)pyrene, 174-178
K vitamins, 178-184
stabilizers
combinations, cooperative phenomena, 103-106
stabilizers—*contd.*
mechanisms, antioxidant transformation products, 85-107
see also antioxidants
stilbenequinone
bleaching and, 90
colour development in polyolefins, 334-345
structure, 4
UV and visible absorption characteristics, 338
styrene–acrylonitrile, with poly(vinyl chloride), photodegradation, 125-132
styrene–isoprene–styrene (SIS) copolymer, 293
sulphides
peroxidolytic antioxidants, limitations, 15
see also sulphur-containing compounds; thiocompounds
sulphur dioxide, stoichiometric reaction with hydroperoxides, 14
sulphur-containing compounds
autoxidation, 14
intermediate free radicals, 15
peroxidolysis, catalytic (PD-C), 11-12
peroxidolytic antioxidants, lubricating oils, 13
Systol T
characterisation, 112-113
uninhibited thermo-oxidation, 112-118
see also polyether alcohol (PEA)

terephthalate polyesters
cold ring fraction (CRF) products, 190-200
thermal degradation studies, 187-203
tetrahydrofuran
formation, 188, 195, 202
structure, 201
2,2,6,6-tetramethyl-4-benzoyl-piperidine-N-oxyl, nitroxyl radicals, 326-327
thermal degradation studies
decomposition mechanisms, 200-203
isothermal conditions, 197-200
programmed heating conditions, 190-197
thermal gravimetry (TG), 190-200
thermal processing, effect on polymer stabilization, 20-22
thermal volatilization analysis (TVA), terephthalate polyesters, 190-200
thermo-oxidation, compared with photo-oxidation, 153-155

thiobisphenols
  antioxidant activity, 94
  S-transformation, 94
thiocompounds
  reaction pathways, 87
  stabilization mechanisms, 86-88
  structure, 86-88
thiolates, stabilization mechanisms, 86-88
thionophosphoric acid, peroxide decomposition, 18
thionosulphonic acid, peroxide decomposition, 18
thiosynergists, and HALS, 106
Tinuvin 770, structure, 40
titanium dioxide
  applications, 244
  electrophotographic and microwave photodielectric studies, 243-261
  microwave photodielectric measurements, 254-261
  photo-catalytic pigment, 155-163
  photoconductivity, first reported, 245
  photo-oxidation, 244-245
tocopherols
  chain breaking donor antioxidants, 5
  melt stabilizer, polypropylene, 5
transformation products, hindered phenolic antioxidants, 333-345
8(6-ethoxy-2,2,4-trimethyl-1,2-dihydro-1-quinolyl)-2,2,4-trimethyl-6-quinolone, 97
6-ethoxy-2,2,4-trimethyl-1,2-dihydro-quinoline, 97
6-ethoxy-2,2,4-trimethyl-8-quinolone, 97
2,2,4-trimethyl-6-quinolone, 97
2,2,4-trimethyl-6-quinolone-N-oxide, formation, 97

UV 531 light absorber, structure, 39
UV light, new free radicals, 5
UV spectra, poly(vinyl chloride) with styrene–acrylonitrile, 128-129
UVA1
  structure, 339
  UV and visible absorption characteristics, 338

vinyl, vinylidine, *trans*-vinylene, formation from polyethylene, linear low density, 311-322
vitamin C, oxyl radicals, 175
vitamin E
  antioxidant
    haemoprotein intramolecular electron transfer, 174
    oxyl radicals, 175

wavelength effect, mono/polychromatic light, polycarbonate/poly(methyl methacrylate) blends, 75-84

Xenotest 1200 exposure equipment, 207

yellowness index
  polyolefins, 334, 337
  vs concentrations of antioxidant transformation products, PP, HDPE, LLDPE, 340

zinc dithiolates, antioxidant action, 19-20
zinc oxide, photo-catalytic pigment, 155-163